

Notice of Allowability

Application No.

10/634,148

Examiner

Richard Chan

Applicant(s)

PROCTOR, JAMES A.

Art Unit

2618

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to 4/13/07.
2. ☒ The allowed claim(s) is/are 1-65.
3. ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) ☐ All b) ☐ Some* c) ☐ None of the:
 1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
 5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
 - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
 - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
 - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☐ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3. ☒ Information Disclosure Statements (PTO/SB/08),
Paper No./Mail Date _____
4. ☐ Examiner's Comment Regarding Requirement for Deposit
of Biological Material
5. ☐ Notice of Informal Patent Application
6. ☐ Interview Summary (PTO-413),
Paper No./Mail Date _____
7. ☐ Examiner's Amendment/Comment
8. ☐ Examiner's Statement of Reasons for Allowance
9. ☐ Other _____

DETAILED ACTION

Allowable Subject Matter

1. Claims 1-65 are allowed.
2. The following is an examiner's statement of reasons for allowance:

With respect to claim 1, the closest prior art of record, specifically Secord, *et al.*, (WO 98/43373), Jou, *et al.*, (WO 99/14878) and Yano, *et al.*, (U.S. Patent 5,559, 790) fail to specifically disclose or provide motivation to teach a physical layer processor comprising: a source signal including data; an FEC (Forward Error Correction) coder to receive the source signal and produce an enhanced source signal including data coded with error correction information; a demultiplexer coupled to receive the enhanced source signal from the FEC coder; a plurality of modem processors, each of which is coupled to a unique output of the demultiplexer to process respective portions of the enhanced source signal in independent channels; a summer coupled to receive outputs of the modem processors to produce an aggregate signal, the aggregate signal being a summation of the enhanced signal processed in independent channels; and a transmitter to transmit the aggregate signal over a carrier frequency.

Specifically, the limitation of producing an aggregate signal by summing (via an adder) portions of a coded source signal that are demultiplexed and processed in separate independent channels. Secord discloses a system in which error coded data information is multiplexed for processing and transmitted on different carrier frequencies

using separate transmitters. Fig. 1 illustrates that each independent channel is modulated onto carrier frequency f_1 , f_2 or f_3 . There is no combining of information processed in independent channels to produce an aggregate signal that is transmitted as in the claimed invention. Consequently, Secord does not teach or suggest producing an aggregate signal by summing portions of an encoded data signal that are demultiplexed and processed in independent channels. This aspect of the claimed invention is advantageous because fewer transmitters such as a single transmitter can be used to transmit the coded signal over a wireless link. Similarly, Jou discloses processing on multiple channels in which information is transmitted on multiple separate carrier frequencies.

Furthermore, Yano discloses use of an adder to combine signals from multiple modem devices, however, Yano does not teach or suggest producing an aggregate signal by summing portions of an encoded data signal that are demultiplexed and processed in independent channels.

Specifically, in Yano at col. 4, lines 9-11 reads "Transmission data 101 inputted to the modem 105-i is inputted to an encoder 201 and subjected therein to encoding process for error correction." Based on this passage, any encoding is done in each of multiple modem devices. Therefore, encoding logic in Yano would need to be duplicated for each modem. Notably, Yano does not discuss a use of error coding because it is directed to a method of controlling power output levels.

Therefore, the prior art of record fails to specifically disclose or provide the motivation to teach a physical layer processor comprising: a source signal including

data; an FEC (Forward Error Correction) coder to receive the source signal and produce an enhanced source signal including data coded with error correction information; a demultiplexer coupled to receive the enhanced source signal from the FEC coder; a plurality of modem processors, each of which is coupled to a unique output of the demultiplexer to process respective portions of the enhanced source signal in independent channels; a summer coupled to receive outputs of the modem processors to produce an aggregate signal, the aggregate signal being a summation of the enhanced signal processed in independent channels; and a transmitter to transmit the aggregate signal over a carrier frequency.

Regarding claim 11, the closest prior art of record (see above) fails to specifically disclose or provide motivation to teach a physical layer processor comprising: a receiver that receives a wireless signal from a transmitter, the wireless signal being formed at the transmitter by a summation of portions of a coded signal that were processed in independent channels but were wirelessl',/transmitted as a single aggregate signal; a plurality of demodulators coupled to receive an output of the receiver; and a multiplexer coupled to direct an output of the demodulators to an FEC (Forward Error Correction) decoder to recover a single unitary information signal.

Specifically, the limitation "receiving a wireless signal from a transmitter, the wireless signal being formed at the transmitter by a summation of portions of a coded signal that were processed in independent channels but were wirelessly transmitted as a single aggregate signal", is distinguished over the cited references because the

aggregated signal of error correction coded information processed in separate channels is combined before it is transmitted out over the wireless channel to the receiver, particularly, resulting in the signal being processed at the receiver.

Regarding claim 27, the closest prior art of record (see above) fails to specifically disclose or provide motivation to teach a physical layer signal processor for use in transmitting a wireless signal, the signal processor comprising: a Forward Error Correction (FEC) encoder, connected to receive a source signal, and to apply an error correction code; a demultiplexer in communication with the FEC encoder, the demultiplexer outputting two or more demultiplexed encoded signals; a plurality of modem processors, each receiving a respective one of the plurality of the demultiplexed encoded signals, the modem processors each modulating a respective one of the demultiplexer outputs applied thereto to produce a respective one of a plurality of transmission code modulated signals, the signal processor further characterized by: a summer that is connected to receive the plurality of transmission code modulated signals to thereby produce an aggregate signal; and a transmitter connected to receive the aggregate signal output by the adder, for producing an aggregate transmitted signal.

Specifically, the limitation "the signal processor further characterized by: a summer that is connected to receive the plurality of transmission code modulated signals to thereby produce an aggregate signal; and a transmitter connected to receive the aggregate signal output by the adder, for producing an aggregate transmitted

signal", is distinguished over the cited references because for example, in Jou, the demultiplexed encoded signals output by the demultiplexer are provided to a plurality of modem processors. The modem processors each provide for transmission coding, i.e., code division multiplexed modulating, a respective one of the demultiplexer outputs. However, applicants invention is additionally characterized by the use of the adder which is employed to sum each of the plurality of transmission code modulated signals prior to further radio transmission. In particular, the adder produces an aggregate signal. It is this aggregate signal that is then applied to the radio transmission equipment, i.e., carrier modulation and up-conversion. No such aggregate signal and encoding as in the claimed invention is taught by any of the cited references.

Regarding claims 19 & 35, recite similar limitations as discussed above and allowed for the same reasons.

3. Regarding new independent claims 56 and 62, these claims are directed to a CDMA transmitter for transmitting a high data rate communication containing allowable subject matter for claim 1.

The limitation within the instant application in claims 56 and 62 that a turbo encoder that turbo encodes the block, refers to an FEC (Forward Error Correction) coder to receive the source signal and produce an enhanced source signal including data coded with error correction information.

And the demultiplexer that demultiplexes the turbo encoded block into a plurality of data channels, refers to the limitation "a demultiplexer coupled to receive the enhanced source signal from the FEC coder."

And the plurality of processing circuits that create a respective CDMA channel for each of the plurality of data channels, refers to a plurality of modem processors, each of which is coupled to a unique output of the demultiplexer to process respective portions of the enhanced source signal in independent channels.

And a combiner that combines the plurality of CDMA channels is referring to the summer coupled to receive outputs of the modem processors to produce an aggregate signal, the aggregate signal being a summation of the enhanced signal processed in independent channels.

And finally the transmitter circuit that transmits the combined plurality of CDMA channels as a wireless signal is referring to a transmitter to transmit the aggregate signal over a carrier frequency.

Claims 57-58 depend on allowable claim 56.

Claims 63-65 depend on allowable claim 62.

Regarding new independent claim 59, these claims are directed to a CDMA transmitter for transmitting a high data rate communication containing allowable subject matter for claim 11.

The limitation within the instant application that discloses a receiving circuit that receives a wireless signal comprising a plurality of CDMA channels refers to a receiver that receives a wireless signal from a transmitter.

And the plurality of demodulation circuits, the plurality of demodulation circuits recovering a plurality of data channels from the plurality of CDMA channels, is referring to a plurality of demodulators coupled to receive an output of the receiver.

And a multiplexer for multiplexing the plurality of data channels into a single data stream refer to a multiplexer coupled to direct an output of the demodulators to an FEC decoder to recover a single unitary signal.

And finally the turbo decoder for turbo decoding the single data stream to provide a block of high data rate data refers to the FEC decoder recovering a single unitary information signal.

Claims 60-61 depend on allowable claim 59.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

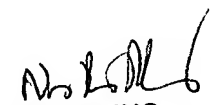
Conclusion

4. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Richard Chan whose telephone number is (571) 272-0570. The examiner can normally be reached on Mon - Fri (9AM - 5PM).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nay Maung can be reached on (571)272-7882. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Richard Chan
Art Division 2618
8/3/07



NAY MAUNG
SUPERVISORY PATENT EXAMINER